

REMARKS

In the Office action dated January 28, 2002, claims 34, 36, 38, 48, and 53 were rejected under the judicially created doctrine of obviousness-type double patenting. Claims 34, 38, 43, 48, 52, 53, 55, 60 and 61 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,709,224 ("Behl"). Claims 68, 72-74, 77, and 78 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,885,278 ("Fleischman"). Claims 34, 36, 38-40, 43, 48-50, 52, 53, 55, 60, 61, 65 and 66 were rejected under 35 U.S.C. 103(a) as being unpatentable over Behl in view of Fleischman. Claims 41, 42, 51, 67, and 79-82 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

Attached hereto is a marked-up version of the changes made to the claims by the present amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

By the present amendment, claim 34 has been amended and claims 83-84 have been added. Claims 34, 36, 38-43, 48-53, 55, 60-61, 65-68, 72-74, and 77-84 are pending and under consideration in the present application. Claims 35, 37, 44-47, 54, 56-59, 62-64, 69-71, 75, and 76 were withdrawn from consideration as being drawn to an unelected species. Applicant respectfully requests reconsideration of the present application.

OBVIOUSNESS-TYPE DOUBLE PATENTING

Claims 34, 36, 38, 48, and 53 were rejected under the judicially created doctrine of obviousness-type double patenting. Should these claims be found to be otherwise allowable over prior art, Applicant will submit a terminal disclaimer to obviate this rejection.

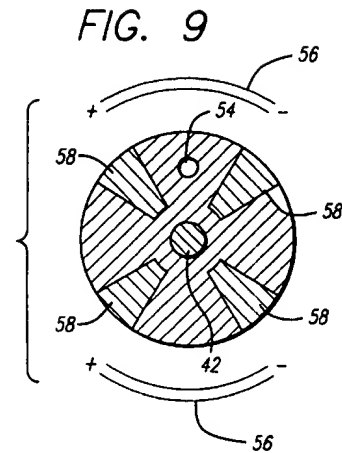
SECTION 102 AND 103 REJECTIONS

Claims 34, 38, 43, 48, 49, 52, 53, 55, 60 and 61 were rejected under Section 102(e) as being anticipated by Behl, and claims 68, 72-74, 77, and 78 were rejected under Section 102(e) as being anticipated by Fleischman. Claims 34, 36, 38-40, 43, 48-50, 52, 53, 55, 60, 61, 65 and 66 were rejected under Section 103(a) as being unpatentable over Behl in view of Fleischman.

The Office action asserted that "Behl discloses a catheter (figs 5-9C) having a working end 56, and at least two electrodes 70 to cause shrinkage of a blood vessel." The Office action also asserted that Fleischman discloses "at least four exposed, electrically conductive surfaces 20(1), in fig. 9;" and "a plurality of electrically conductive lines ... electrically connected to the exposed surfaces" in Figures 10 and 11A. The Office action, however, also noted that "Fleischman is moot to cause preferential shrinkage of a vein."

Applicant respectfully submits that Behl does not disclose or suggest the electrodes "to produce a directional RF field" to cause preferential shrinkage along a circumferential portion of the vein as recited in independent claim 34; or the "directional energy application apparatus" as recited in independent claim 53. The Office action

asserts that these are recitations of intended uses, and suggests that they do not result in a structural difference between the claimed invention and the prior art. Applicant respectfully submits that the claimed invention requires that the application of energy such as RF energy be limited to only a select portion of the circumference, and not the entire circumferential area. This is illustrated in, for example, Figure 9 of the present application. And as discussed on page 8, lines 19-23 of the specification:



The electrodes directionally provide RF energy at the working end of the catheter to heat and shrink selected venous tissue between the electrodes. The directional application of RF energy in effect forms a heating zone along a portion of the catheter, and allows for localized or preferential heating of venous tissue so that shrinkage of the venous tissue can be limited to selected areas of the vein ...

As noted on page 3, lines 27-32 in the background section of the present application, this is different from a device that is "substantially omni-directional in nature and does not permit the application of energy to only a selected portion of the vein."

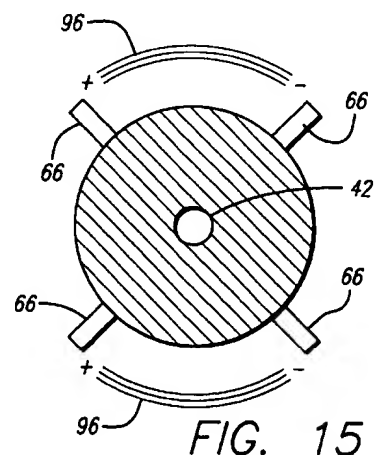
Applicant respectfully submits that neither Behl nor Fleischman discloses an electrode configuration that would apply energy to a circumferential portion of the vein.

With respect to the Section 103 rejection, as noted in the Office action, "Fleischman is moot to cause preferential shrinkage of a vein," but asserts that it would have been obvious to one of ordinary skill in the art to use Behl's energy ranges with Fleischman's ablation catheter. Fleischman is directed to ablating myocardial tissue to interrupt

potential electrical pathways in the heart (and restore normal function to the heart), whereas Behl is directed to occluding blood vessels (and prevent the blood vessels from functioning). No proper motivation has been provided for one of ordinary skill to combine the teachings of prior art directed to such different problems in the manner suggested by the Office action. Applicant respectfully submits that the Section 103 rejection of the claims be withdrawn as well.

With respect to claim 68, the Office action has not identified the polarity of the various electrode elements 28 of the half-loop structures 20(1) disclosed in the Fleischman reference. As noted in Applicant's prior response, the teaching in Fleischman of "creating continuous, long and thin, lesion patterns in tissue when ablation energy is applied simultaneously to adjacent emitting electrode elements 28," suggests that each electrode is located adjacent to another electrode of unlike polarity. See Fleischman at col. 9, lines 33-37. Applicant again respectfully submits that Fleischman does not disclose or suggest having "each exposed surface [being] located adjacent another exposed surface of like polarity and adjacent exposed surface of unlike polarity; whereby energy imparted by a pair of exposed surfaces of unlike polarity is directional" (emphasis added), as recited in independent claim 68. This like/unlike configuration is illustrated in Figure 15, for example. Applicant respectfully submits that this

configuration is not disclosed in or suggested by Fleischman, and respectfully requests that the Section 102 rejection based on Fleischman be withdrawn as well.



Should the presently rejected claims be found to be allowable over prior art, then the Applicant also respectfully requests that the claims which were withdrawn from consideration as being drawn to an unelected species, be considered and allowed as well.

CONCLUSION

Applicant respectfully requests favorable reconsideration of the claims at an early date. If the Examiner has any comments or questions regarding any of the foregoing, kindly telephone the undersigned.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

34. (Amended) An apparatus for applying energy to cause shrinkage of a vein, the apparatus comprising:

a catheter having a shaft with an outer diameter and a working end, wherein the outer diameter of the catheter is less than the inner diameter of the vein; and

at least two electrodes located at the working end of the catheter, wherein the electrodes are spaced apart from one another so as to produce a directional RF field to heat a venous treatment area adjacent the electrodes along a circumferential portion of the vein to cause preferential shrinkage of the vein when RF energy is applied to the vein by the electrodes.

Please add the following new claims 83 and 84.

83. (New) The apparatus of claim 34 wherein the electrodes are configured so as to not penetrate the vein.

84. (New) The apparatus of claim 53 wherein the directional energy application apparatus is configured so as to not penetrate the vein.